Characterization of natural and induced UV-blue thermoluminescence properties of kaolinite

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The UV-blue thermoluminescence (TL) emission of natural kaolinite has been investigated to determine its potential use in the field of dating and retrospective dosimetry. This paper focuses on: (i) The dose dependence of the 400nm TL intensity of kaolinite that exhibits an excellent linearity in the range of 50mGy-8Gy. (ii) The stability of the induced TL signal after six months of storage, shows an initial rapid decay (ca. 45%) maintaining the stability from 40 days onwards which indicates that the electron population decreases asymptotically by the X-axis and the involved electrons are located in deeper traps at room temperature. The fading process can be fitted to a first order decay equation of the sort $y=y0+A \exp(-x/t)$. (iii) The tests of thermal stability at different temperatures allow us to speculate in a continuous trap distribution with progressive changes in the glow curve shape, intensity and temperature position of the maximum peak. According to this behaviour some physical parameters have been estimated.